



Missouri Resources

Winter 2020 • Volume 37 • Number 1



Missouri Resources

Winter 2020 • Volume 37 • Number 1

GOVERNOR OF MISSOURI Michael L. Parson

DEPARTMENT DIRECTOR Carol S. Comer

DEPUTY DIRECTOR Dru Buntin

DEPUTY DIRECTOR Katie Jo Wheeler

DIRECTOR, DIVISION OF ADMINISTRATIVE SUPPORT Jennifer Eddy

DIRECTOR, DIVISION OF ENVIRONMENTAL QUALITY Ed Galbraith

DIRECTOR, MISSOURI GEOLOGICAL SURVEY Joe Gillman

ACTING DIRECTOR, MISSOURI STATE PARKS Mike Sutherland

COMMUNICATIONS DIRECTOR Connie Patterson

DEPUTY COMMUNICATIONS DIRECTOR Susan Bloomer

EDITOR Andrew Richmond

DESIGN DIRECTOR Andrea Arwe

ASSOCIATE DESIGNER Cole Heimsath

PHOTOGRAPHERS Ben Nickelson

Andrew Richmond

EDITORIAL BOARD

Stacy Bandelier

Hylan Beydler

Susan Bloomer

Connie Patterson

Brian Quinn

ABOVE

An early winter snow collects on tree branches above Ha Ha Tonka State Park.

MoDNR PHOTO BY BEN NICKELSON

ON THE FRONT COVER

Watkins Woolen Mill State Historic Site, which first began operating in 1860, is home to the only 19th century woolen mill in the country with the machinery still intact.

MoDNR PHOTO BY BEN NICKELSON

ON THE BACK COVER

Hikers take in a view of the Meramac River along the Deer Run Trail at Onondaga Cave State Park, in Leasburg. Onondaga Cave State Park is one of 29 Missouri state parks and historic sites participating in First Day Hikes promoted by America's State Parks.

MoDNR PHOTO BY BEN NICKELSON

CONNECT WITH MoDNR



CONNECT WITH MISSOURI STATE PARKS



table of contents



4 VW Trust Retires Old Diesel Vehicles

BY WESLEY FITZGIBBONS

Funds from the VW Trust settlement are supporting diesel engine replacement projects across the state. More than \$7 million has gone to such projects so far.

8 Land Reclamation Program Oversees Active Mining in Missouri

BY LARRY LEHMAN

Mineral use in our modern world is more diverse than you might think. The Land Reclamation Program regulates the mining operations used to obtain them.

12 2019 Missouri DNR Photo Contest

BY ALICIA WIEBERG

Armed with a camera and a love for Missouri's natural resources, photographers captured fleeting moments for the 2019 contest. See who the winners are and admire their handiwork!

departments

16 Career Connection

17 Explore Missouri

20 Top Spots

22 Trail Highlight

24 Did You Know?

24 Geoscience Today

25 ...But Not Least

ABOVE

Steam rises out of the turquoise waters of the spring after an early winter snow at Ha Ha Tonka State Park.

MoDNR PHOTO BY BEN NICKELSON



VW TRUST RETIRES OLD DIESEL VEHICLES

By Wesley Fitzgibbons



The City of Waynesville was awarded \$45,000 in May 2019 to replace an aging diesel dump truck with a new and more fuel-efficient model. The money given for the new vehicle accounted for 25% of the replacement cost.

MoDNR FILE PHOTO

In 2016, the Volkswagen Corporation (VW) was ordered to create a \$3.9 billion nationwide trust fund dedicated to mitigating excess emissions from their diesel vehicles. Of the total, Missouri was allocated \$41 million to help fund diesel engine replacement projects across the state.

Over the past fiscal year, more than \$7 million has gone toward replacing diesel school buses, public transit buses and other diesel trucks owned by local governments across the state. In that time, 83 schools submitted applications for more than 150 school bus replacements. The department awarded a total of \$4.7 million to those projects, generally on a cost-sharing basis. While most awards equaled 25% of a new bus' cost, because of need, several schools qualified for awards equaling the full replacement cost.

WHAT DOES THE VW TRUST FUND MEAN FOR MISSOURI SCHOOL DISTRICTS?

MORE THAN

\$4.7 mil

has gone toward replacing
diesel school buses across
the state.

83 

**SCHOOLS SUBMITTED
APPLICATIONS FOR MORE THAN**

 **150**

SCHOOL BUS REPLACEMENTS

**THIS SHOULD REDUCE
DIESEL NITROGEN
OXIDE EMISSIONS BY**

**120,000
POUNDS**





Ten retired school buses were donated by the Dexter, Bradleyville, Hillsboro and Joplin school districts to be used by the University of Missouri Fire and Rescue Training Institute to provide valuable training to more than 100 firefighters.

MoDNR FILE PHOTO

School districts are using the VW funding to replace aging diesel buses with newer buses, which emit less nitrogen oxide. Together, this should reduce diesel nitrogen oxide emissions by more than 120,000 pounds, which will make these buses safer for young riders and the environment.

The effort has also created an unforeseen additional benefit. Some school districts donated their old buses to local fire departments for training. Dexter, Bradleyville, Hillsboro and Joplin school districts donated 10 buses for rescue training at the University of Missouri Fire and Rescue Training Institute. The donations allowed more than 100 firefighters to get valuable training to bolster local emergency service capabilities.

The remainder of Missouri's VW Trust allocation went to city and county governments for truck replacement projects that otherwise would have been too expensive. These trucks provide crucial community services, but maintaining aging diesel vehicle fleets is expensive. By replacing old vehicles with cleaner ones, local governments can serve their communities in a more cost-effective manner. Some

local governments and school districts chose to replace their diesel vehicles with alternative fuel vehicles, which require less maintenance and whose fuel is less expensive, allowing these organizations to devote those funds to serve their constituents in other ways.

To further reduce diesel-related emissions in Missouri, the department soon will accept applications under additional funding categories. The new categories will include switcher locomotives, tugboats and ferries, airport ground support equipment, cargo handling equipment and privately owned diesel trucks. For information on the VW Trust Fund, visit dnr.mo.gov/env/apcp/vw/index.html.

Wesley Fitzgibbons is an environmental engineer with the department's Air Pollution Control Program in the Division of Environmental Quality.



Employees with the Land Reclamation Program oversee active mining operations in Missouri and ensure the land is returned to a suitable use after being mined.

Front, Left to Right: Amanda Wieberg, Daniel Wedemeyer, Mariah O'Brien, Ann Teague, Grace Mobley, Dave Dowdy, Larry Lehman, Ashley Harrison and Bill Zeaman

Back, Left to Right: Guy Frazier, Tucker Fredrickson, Rosie Schulte, Mike Mueller, Brent Willeford, Austin Rehagen, Colin Priest

MODNR PHOTO BY BEN NICKELSON

Land Reclamation Program Oversees Active Mining in Missouri

by Larry Lehman

The diverse uses of minerals in our modern world are more numerous than one may realize. Minerals are employed in the creation of materials used to construct roads and buildings, as well as to develop pharmaceutical products. They also are used to manufacture high-tech electronics, national defense and security systems and more.

Minerals play a critical role in our daily lives, and they contribute greatly to Missouri's economy. The U.S. Geological Survey's 2019 report on mineral commodities identified Missouri as the ninth largest producer of nonfuel minerals in the United States for 2018 with a commodity value of \$2.93 billion. These nonfuel minerals are Portland cement, lead, lime, crushed stone and industrial sand and gravel.

Mining activity in Missouri began as early as the 1740s for lead, iron, limestone, sand and gravel. Coal mining in Missouri began in the 1840s. With no legislation or regulation of these operations, as many as 67,000 acres were left unreclaimed by coal-mining operations. An estimated 40,000 acres were abandoned after the mining of other commodities. Missouri was left with a legacy of acid-mine drainage, dangerous highwalls, toxic mine spoils, dangerous mine shaft openings, barren soils, soil erosion and stream sedimentation.

Missouri enacted legislation in 1971 to offset the effects of mining. In 1974, the Missouri Department of Natural Resources' Land Reclamation Program was established to regulate mining operations. Program staff work to ensure mineral resources are available for economic development and the mining industry remains in compliance with state law. The ultimate responsibility of the program is to ensure mine sites in Missouri are returned to a suitable land use and the adverse effects from active mining operations are minimized. When land affected by mining is properly reclaimed, it can again be used for agriculture, wildlife, water bodies and industrial development.

The program also receives annual grants from the U.S. Department of the Interior's Office of Surface Mining Reclamation and Enforcement, which is funded by a federal severance tax on coal mined nationwide, to reclaim abandoned coal mine land.



BEFORE



AFTER

(Above Left and Above Right) One surface coal mining operation is ongoing in Hume, Missouri. Department staff inspect the mine on a monthly basis to ensure proper reclamation is taking place.

MoDNR FILE PHOTO

Land Reclamation

Most often, reclaimed mine land is turned into:

Commercial or
residential land
developments



Water impoundments
for recreation and
agriculture



Wildlife habitat
for deer, turkey
and other wildlife



Land used for
agriculture



Direct Assistance to the Landowners and Industry

Seventeen staff members make up four working units within the program: Administrative, Abandoned Mine Lands, Coal, and Industrial and Metallic Mineral Mining. Together, staff are responsible for reclaiming abandoned mine lands and conducting inspections at all active mining operations in Missouri.

Staff often meet with landowners and company representatives to discuss future plans and concerns. Steve Baker, who is both a landowner and cattle rancher, recently requested a meeting. Baker was concerned when River Cement Company notified him about their plan to mine clay from an area on his property in Franklin County, where the company owns mineral rights. Staff met with Baker and the mining company to address his concerns and questions, and kept him apprised of the process and timelines. As part of the reclamation agreement, River Cement Company will install a heavy-duty cattle guard, ensure the road is in good condition and construct a nearly 1 ½-acre pond for Baker's cattle. After permit issuance, staff received correspondence from Baker that said, "This whole process went very well. The state has a good team."

Missouri Mining Commission

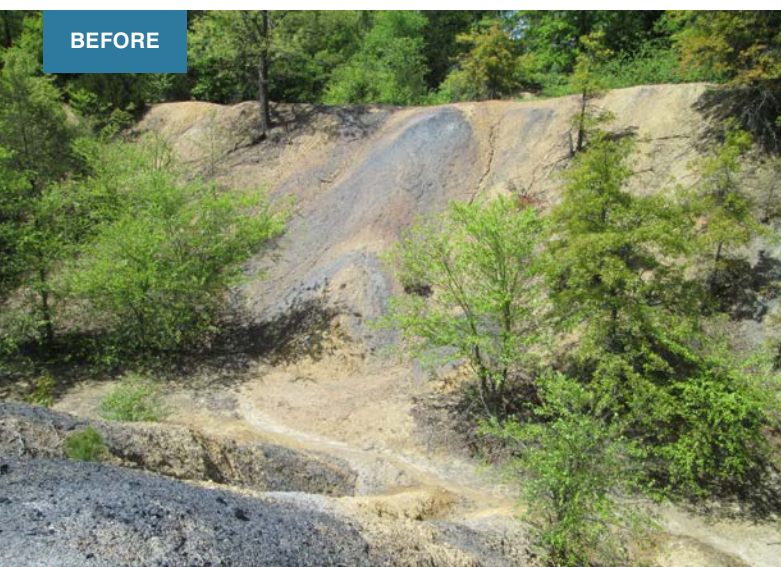
The Missouri Mining Commission is a governing body that represents the Governor and the department in matters related to mineral extraction regulations. The commission includes representatives from industry, academia and the department.

Read more about the Land Reclamation Program online at dnr.mo.gov/geology/lrp/mineralsandmining.htm. A video that highlights successful mining and reclamation efforts in Missouri can be seen at youtu.be/sWZjs_LWUXs.

Larry Lehman is director of the Land Reclamation Program, within the Missouri Geological Survey, a division of the Missouri Department of Natural Resources.

(Below Left and Below Right) Abandoned coal mine lands are plagued by safety and health hazards as well as diminished economic opportunities. These before and after photos of a mine site in Callaway County demonstrate how properly reclaimed mine sites can be used for agriculture, wildlife and water bodies.

MoDNR FILE PHOTO





1st Place

Sara Mauer
Sunrise at Busch Wildlife
August A. Busch Memorial Conservation Area

2019 MissouriDNR *Photo Contest*

by Alicia Wieberg



..... Natural Resources

Category



2nd Place

Beverly Lancaster, New Franklin, Mo.
Fire & Ice
New Franklin, Mo.

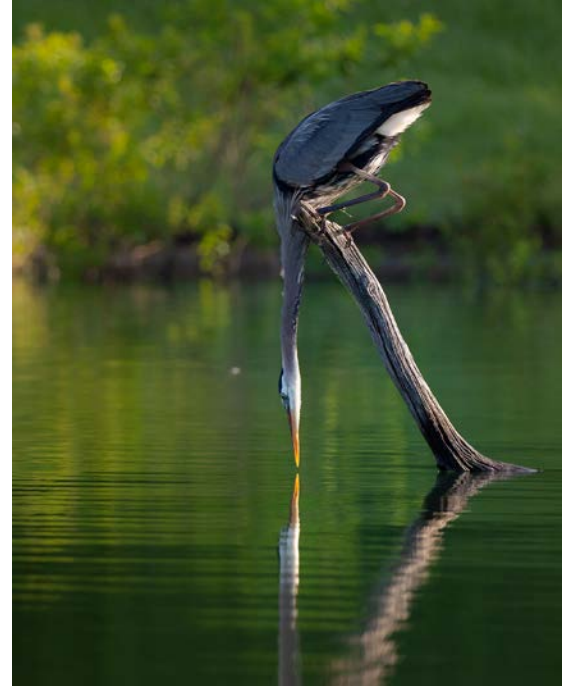
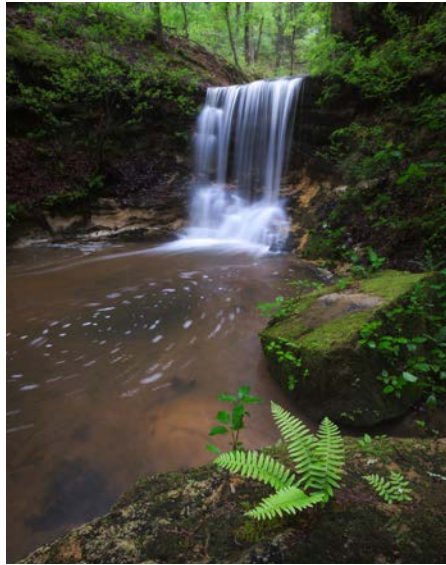
Famous photographer Dorothea Lange once said, "Photography takes an instant out of time, altering life by holding it still." We asked amateur photographers to do exactly that for the sixth annual MissouriDNR Photo Contest: Arm yourself with a camera and a love for Missouri's natural resources and capture a fleeting moment. This year we received more than 350 submissions and selected first, second and third place winners, as well as honorable mention, in three categories: Natural Resources, Unique Places and People Enjoying Missouri's Natural Resources. From sweeping views of Missouri state parks and recreation on Missouri's waterways and trails, to beautiful wildlife and the natural resources they call home, these photos capture the essence of Missouri. Congratulations to the winning photographers and all those who participated in the contest. To see the top photographs selected in each category and learn about the 2020 MissouriDNR Photo Contest, visit dnr.mo.gov/photocontest.

Natural Resources

Category

Honorable Mention

Nicholas Becker
Downstream
Don Robinson State Park



3rd Place

Travis Smith, Joplin, Mo.
Love at First Sight
Viney Creek Recreation Area

Unique Places

Category



1st Place

James Smith, Moro, Ill.
Red Bridge
Sandy Creek Covered Bridge
State Historic Site



2nd Place

Steve Jett, Fenton, Mo.

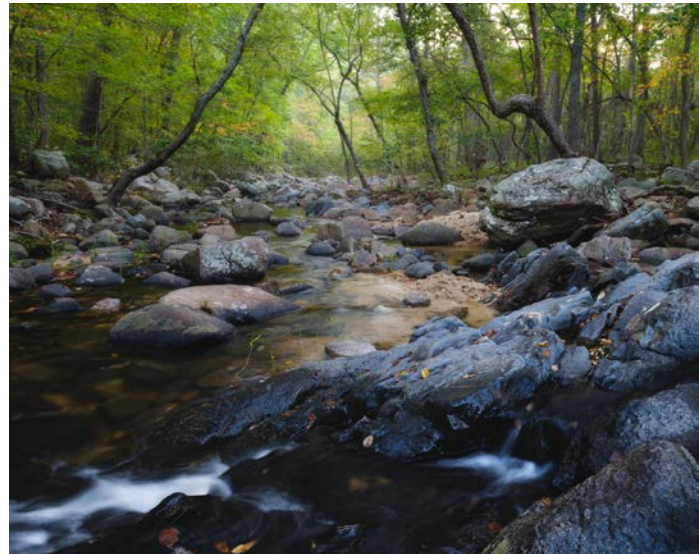
Wet Rock

Dillard Mill State Historic Site



Unique Places

Category

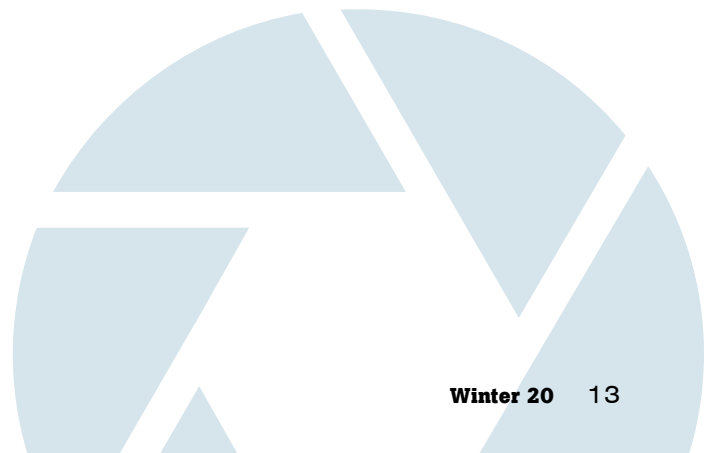


Honorable Mention

Nicholas Becker
Morning at Pickle Creek
Hawn State Park

3rd Place

Nicholas Becker
November Gold
Taum Sauk Mountain State Park



People Enjoying Missouri's Natural Resources

Category :



1st Place

Rachel Williams, Valley Park, Mo.
Two Brothers Canoeing at Sunset on Ray Lake
Vandalia, Mo.

2nd Place

Tom Drennan, St. Louis, Mo.
Sunrise at Creve Coeur
Creve Coeur, Mo



Honorable
Mention

Lisa McClendon, Sikeston, Mo.
Exploring on Wheels
Mingo National Wildlife Reserve



3rd Place

Gail Myer, Branson, Mo.
Misty Morning on Lake Taneycomo
Lake Taneycomo



Mariah O'Brien

Environmental Specialist

Missouri Department of Natural Resources
Land Reclamation Program



Introduce yourself and your program. How long have you worked at MoDNR?

My name is Mariah O'Brien and I'm an environmental specialist with the Land Reclamation Program. I've been with the department for a little over two and a half years. The Land Reclamation Program regulates the

mining industry in the state, and our goal is to ensure that mine land is reclaimed to a beneficial land use once mining is complete. Some examples of land use include wildlife, water impoundment, agriculture and development.

What is your job like on a day-to-day basis?

As part of my daily duties, I accept applications and issue permits. We utilize ArcGIS software for mapping permit boundaries. We also attend public meetings on a regular basis to hear public concerns about a potential operation.

What do you like best about working at MoDNR?

There are a lot of things I like about working for the department, including the flexibility of my work schedule and state benefits, but also being out in the field and working with not only public citizens but industry professionals. I really like the positive difference that we make in the environment and not only protecting it but preserving and conserving our natural resources.

How do you feel your job helps to enhance Missouri's natural resources?

We have to have Missouri's mineral resources to basically survive in today's world. Mineral aggregates are found in pharmaceuticals, roads, homes, toothpaste – a lot of citizens aren't aware of the many uses of mineral aggregates that we use each and every day. For our program, we make sure that reclamation does occur after mining to enhance those resources, and most often they're turned into wildlife habitat for deer, turkey and other wildlife, water impoundments to help with flood control, or development use for building subdivisions and bringing in new citizens. All of those things help preserve and protect our resources after mining is complete.



What would you tell someone thinking about a career with MoDNR?

For those individuals interested in working for the department, I highly recommend it. A lot of our programs work together as a team to accomplish many goals, and you're surrounded by people who really share the same passion that you have for the environment. I came to the Missouri Department of Natural Resources because I have a passion for not only geology but our natural resources in general. By working for the department, I get to be a part of that each and every day – out in the field around my geologic surroundings, and I'm able to study that and help our citizens understand that as well.



(Top and Bottom) Employees with the Land Reclamation Program meet with the regulated public and concerned citizens to answer questions about mining projects. They also inspect mine operations and ensure that reclamation efforts occur after mining has concluded at a site.

MoDNR PHOTOS BY BEN NICKELSON



**Watch Mariah's interview
on YouTube.**



Olive and Nathan Boone's tombstones stand in the family cemetery at Nathan Boone Homestead State Historic Site.

Explore Cemeteries in Missouri State Parks and Historic Sites

by Jim Malven
photographs by Ben Nickelson

In 1967, the Missouri State Legislature enacted a statute requiring the State Park Board to "maintain every grave of a former governor within the state which is not within a perpetual care cemetery." Today, the Missouri Department of Natural Resources maintains the graves of four Missouri governors. In addition, many of Missouri's state parks and state historic sites contain the graves of famous Missouri families and their slaves.

Gov. Daniel Dunklin's Grave State Historic Site

Gov. Daniel Dunklin's Grave State Historic Site, situated on a bluff overlooking the Mississippi River in Herculaneum, houses the grave of Missouri's fifth governor (1832-1836) and his wife, Emily. As governor, Dunklin oversaw the establishment of Missouri's public school system and laid the groundwork for the University of Missouri. He also advocated for the humane treatment of prisoners.

Jewell Cemetery State Historic Site

Jewell Cemetery State Historic Site, located within the city limits of Columbia, contains the grave of Missouri's 22nd governor, Charles Hardin (1875-1877), and descendants of George Jewell. The most famous of Jewell's descendants buried here is his son, William Jewell, who died while establishing a college in Liberty, Missouri, that bears his name. The cemetery also contains about 20 unmarked graves, believed to be those of the family's slaves.

Sappington Cemetery State Historic Site

Sappington Cemetery State Historic Site, near Arrow Rock, contains the grave of a prominent area doctor, Dr. John Sappington, along with many of his family members, including two Missouri governors.

Meredith Miles Marmaduke became Missouri's eighth governor, for nine months in 1844, after the death of Gov. Thomas Reynolds. Claiborne Fox Jackson, a strong supporter of the Confederacy, was beginning

his term as Missouri's 15th governor when the Civil War began and he was driven from Jefferson City by Union supporters. Both were married to daughters of Sappington.

Sappington also gave the family slaves a tract of ground as a burial place. Known as the "Sappington African American Cemetery," it is located on Route AA, one quarter of a mile south of the Sappington Cemetery. It became part of the state historic site in 2014.

Nathan Boone Homestead State Historic Site

One of many examples of a state historic site with an interesting cemetery can be found at Nathan Boone Homestead State Historic Site.

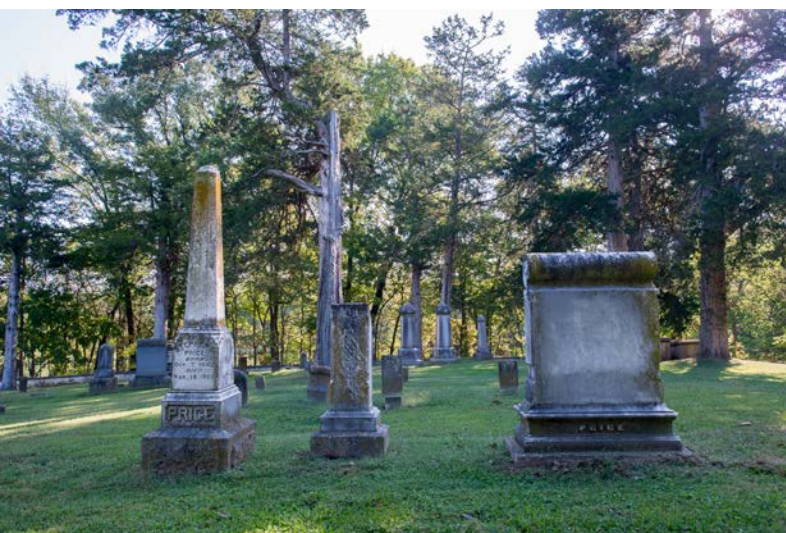
Nathan Boone Homestead State Historic Site, in Ash Grove, has both a family cemetery and a slave cemetery. The family cemetery houses the graves of Nathan Boone, a son of the legendary Daniel Boone, his wife, Olive, and several other family members. The slave cemetery has numerous headstones, two of which have been found with names inscribed on them.

Before planning your trip, visit mostateparks.com for more information.

Jim Malven is a public information specialist with the Missouri Department of Natural Resources' Division of State Parks.



Visitors to Nathan Boone Homestead State Historic Site can take interpretative tours of the family and slave cemeteries on the property.



(Above Left) Sappington Cemetery State Historic Site, near Arrow Rock, houses the grave of prominent area doctor, Dr. John Sappington, along with former Missouri governors Meredith Miles Marmaduke and Claiborne Fox Jackson.

(Above Right) Gov. Daniel Dunklin's Grave State Historic Site, located in Herculaneum, holds the grave of Missouri's fifth governor and overlooks the Missouri River.



Missouri's American Indian Cultural Center at Annie and Abel Van Meter State Park displays permanent and temporary exhibits that interpret the cultural history of the nine tribes that called Missouri home in the 19th century.

MoDNR PHOTO BY BEN NICKELSON

Top Spots to Visit a Museum

With winter in full swing, take advantage of the indoor opportunities Missouri state parks and historic sites have to offer by exploring a number of visitor centers and museums.



Visit Missouri's American Indian Cultural Center at Annie and Abel Van Meter State Park to learn about the state's original inhabitants. The park contains remnants of a Missouri Indian village that sat at the Great Bend of the Missouri River. The center interprets the homeland of the Missouri, the history of American Indians in Missouri and the park's natural landscape.

Permanent displays include early maps of North America showing European exploration and contact with American Indian tribes. A large mural depicts the life of the Missouri Indians when they lived in the area more than 300 years ago. A 10-minute video tells the story of the Missouri Indians and the development of the park.

Park staff offer a variety of cultural and natural interpretive programs for groups and classes. Personal audio guides are available for guests to check out at the front desk at no cost. Entrance to the cultural center and the park is free.

For a more comprehensive look at Missouri history, take a trip to the Missouri State Museum, located in the state Capitol. The museum is divided into two exhibit halls, the History Hall and the Resources Hall, which house an impressive collection of exhibits portraying the state's natural and cultural history. The museum also administers nearby Jefferson Landing State Historic Site, which includes the Lohman Building and the Union Hotel.

The Missouri State Museum is responsible for approximately 30,000 artifacts and objects covering all aspects of Missouri history. It also presents traveling exhibits, offers classes and special programs and provides tours of the Capitol. A small gift shop is located at the entrance of the Capitol.

For more information on these museums, visit mostateparks.com.

(Below Left) A 45-minute tour is the best way to experience the historic and decorative features of Missouri's Capitol.

(Below Right) The Missouri State Museum in the lower level of the state Capitol showcases Missouri's cultural and natural history through informational exhibits and displays.

MoDNR PHOTOS BY BEN NICKELSON





Park guests hiking the Interpretive Loop Trail will witness spectacular views of Grand Gulf, Missouri's "Little Grand Canyon."

MoDNR FILE PHOTO

Explore Missouri's "Little Grand Canyon" on the Interpretive Loop Trail at Grand Gulf State Park



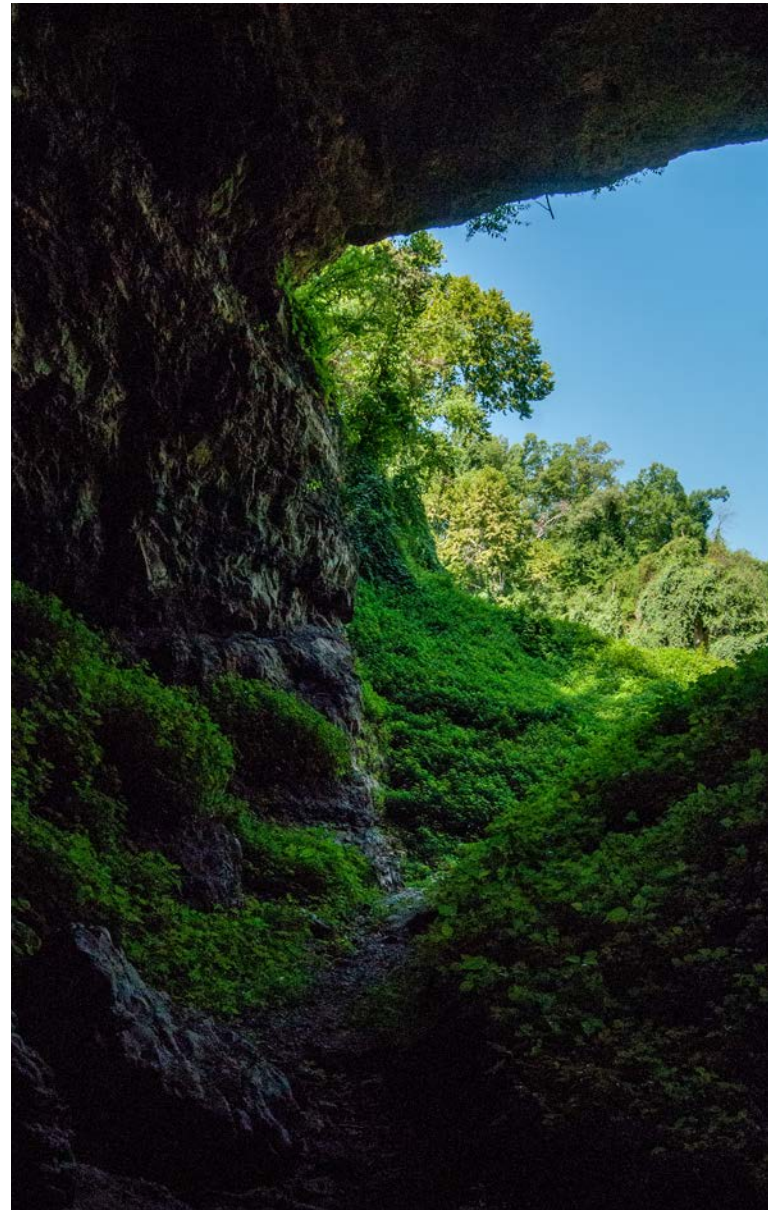
The trail's 62 steps allow visitors to view the bottom of the gulf and a wet-weather waterfall.

MoDNR FILE PHOTO

Grand Gulf State Park, located in Oregon County near the Arkansas border, is home to some of the most stunning geological features in the state. The park contains a number of caves and sinkholes, a natural bridge and a vertical-walled canyon for which the park is named. The "Grand Gulf" stretches almost three-quarters of a mile among 130-foot-high walls. The gulf is a true chasm – deeper than it is wide – and nicknamed the "Little Grand Canyon." In 1986, the site was designated as a natural area to recognize and protect its natural beauty.

Visitors can view the gulf from the park's 0.1-mile Interpretive Loop Trail. Four overlooks offer views of the collapsed cave system that formed the gulf and the remaining cave in the Grand Gulf sink. Unusual rock formations and geological features are visible while hiking along the trail. Interpretive panels located at the parking lot kiosk and along the trail explain the formation of the gulf and point out various geological features.

The trail's 62 steps allow visitors to view the bottom of the gulf and a wet-weather waterfall. A platform provides a place to stop and take in the beautiful views. While hiking down the steps, visitors can see the bluff and view the different layers of chert and dolomite, interspersed with sprays of vegetation. Numerous stopping areas are available for taking in the views, as well as resting before departing the trail.



Visitors can see the remains of the collapsed cave system, as well as the remaining cave, located in the Grand Gulf sink.

MoDNR FILE PHOTO

The surface of the trail is crushed rock with steps and steep slopes. Visitors should wear a comfortable pair of shoes or hiking boots. In addition to the Interpretive Loop Trail, the Natural Bridge Trail takes hikers over the natural bridge and offers a glimpse of the spectacular Grand Gulf. Volunteers are always welcome to help maintain the trail, and interested parties should contact park staff for details. For more information on Grand Gulf State Park, visit mostateparks.com.

didyou know

February is **EARTHQUAKE AWARENESS MONTH** in Missouri

February is Earthquake Awareness Month in Missouri – a good time to learn about the science of earthquakes and steps one can take to be prepared in the event an earthquake occurs.

Southeastern Missouri experiences small earthquakes nearly every day. These earthquakes typically are too small to be felt, but are recorded on seismographs, which are devices that measure the earth's movement.

Most Missourians are familiar with the large 1811-1812 earthquakes that occurred in the New Madrid Seismic Zone in southeastern Missouri. This seismic zone extends into a multi-state area and is famous for a series of three major earthquakes (believed to have been magnitude 7.0 or larger) that occurred in the two-month period between Dec. 16, 1811, and Feb. 7, 1812. In addition, hundreds of moderate earthquakes (estimated at magnitude 5.0 to 6.5) and thousands of smaller earthquakes (estimated at magnitude 5.0 to 4.0) occurred between the larger earthquakes, shaking the area for several months. These earthquakes were felt and recorded in personal journals as far away as Louisville, Kentucky, and Cincinnati, Ohio.

Earthquake Summit 2020 will be held Feb. 21, at Three Rivers College in Poplar Bluff. The event is open to the public and free to attend. Register online at sema.dps.mo.gov/earthquake_preparedness/summit.php.

Learn more about earthquakes in Missouri online at dnr.mo.gov/geology/geosrv/earthquakes.htm.

geoscience today

Conduit Inspections for Dams: What? Why? How? When?

What?

Dams provide many benefits including water supply, flood protection, hydropower, irrigation and recreation. However, failure of a dam can be catastrophic. Staff with the Department of Natural Resources' Dam and Reservoir Safety Program currently oversee 705 dams (non-agricultural, non-federal dams that are 35 feet or more in height). Many dams are built with spillway conduits – pipes that travel through the embankment and safely discharge water. If not properly constructed, operated and maintained, a major problem could arise.

Why?

Spillway pipes must be watertight. A condition known as "piping" occurs when water exits the pipe before reaching the outlet. Piping causes erosion around the pipe. Erosion weakens the embankment and eventually results in the formation of cavities within the embankment. Cavities weaken the soil, resulting in sinkholes or landslides, which can lead to dam failure.

How?

Staff use an Envirosight Rovver X robotic camera system to inspect pipes. The unit travels inside the pipe collecting photographs and video. A handheld controller

provides live video that is recorded to a USB drive, which is invaluable for engineering review. Without this equipment, it is difficult to know a pipe has a defect until after the embankment surface shows signs of collapse.

When?

Since acquiring the equipment in 2015, 33 conduit inspections have been completed. Approximately 220 conduits in Missouri's regulated dams have met their design life and may benefit from inspection. Innovative solutions like this inspection system provide critical information to help ensure long-term, operational safety of dams in the protection of dam owners and the downstream public. Learn more online at dnr.mo.gov/geology/wrc/damsafety.htm.



Failure of a corrugated metal pipe caused severe soil erosion on an earthen dam.

MoDNR FILE PHOTO

Department of Natural
Resources offers

SUMMER *Internship Program*

by Katy Plaster

The Missouri Department of Natural Resources is excited to offer 72 different internship opportunities for summer 2020. Opportunities are available in a variety of fields, including geology, environmental science, engineering, state parks and research.

Summer internships provide a valuable opportunity for students to develop and refine their skills in order to gain real-world experience in their area of study. Students get the chance to build their resumes, network with professionals in the field, get professional feedback and gain confidence and an edge on the job market. Some colleges even count internships toward course credit. Internships provide an excellent way to “try out” a certain career and most internships with the Department of Natural Resources are paid.

In creating a hands-on environment for interns, the department hopes to instill a love of natural resources and help students grow professionally. Some of the duties our summer interns can expect to perform include: collecting water quality data, analyzing well pump test data, conducting groundwater dye tracing, leading nature walks and hikes, helping with prairie restoration, preparing prescribed burns, leading historic site tours or collecting fish tissue samples.

By spending a summer working for the Missouri Department of Natural Resources, interns will see that



Summer internships provide opportunities for students to gain hands-on experience developing their skills. Summer interns with the department's Division of State Parks have the opportunity to interact with the public at events like Outdoor Days at the Missouri State Capitol.

MoDNR FILE PHOTO

working for the state, and serving Missourians, offers a type of job satisfaction not often found in other careers. The State of Missouri is focused on several initiatives in order to recruit, retain and train top talent in order to serve our citizens at maximum capacity. These efforts include employee engagement, award and recognition programs, as well as performance incentives. The state is also focused on diversity and inclusion training, LEAN training to make our current processes more effective and Leadership Academy Training. The State of Missouri has implemented MO Learning through LinkedIn, which provides more than 7,000 courses that our employees can use to further their professional career.

If you are interested in becoming an intern for the Department of Natural Resources this summer, visit dnr.mo.gov/hr/internships.htm and submit your application by March 15. For more information, contact the department recruiter, Katy Plaster, at dnr.recruiter@dnr.mo.gov.

Start 2020 off on the right foot by taking a guided hike in a Missouri state park on New Year's Day. First Day Hikes are held in state parks throughout the country and more than 30 hikes are offered in Missouri. For more information, visit **mostateparks.com/FirstDayHikes**.



dnr.mo.gov

